

Application No. 10/666,182  
Reply to Office Action of February 13, 2006

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### REMARKS/ARGUMENTS

In the Office Action dated February 13, 2006, the Examiner rejected claims 1 and 9-14; and claims 2-8, and 15-27 were withdrawn from consideration subject to an election requirement. Claims 1-27 remain pending in the application. Reconsideration and allowance of all pending claims are requested.

#### Summary of Interview

Applicants appreciate the Examiner's time and consideration during a telephonic interview on April 5, 2006. In the interview, the undersigned on behalf of Applicant argued two main points: (1) U.S. Patent No. 5,714,202 (hereinafter "Lemelson") and U.S. Patent No. 6,190,124 (hereinafter "Freling") do not teach or suggest a braze alloy as recited in claim 1 of the present application; and (2) U.S. Patent No. 2,763,920 (hereinafter "Turner") does not teach or suggest "wear resistant particles" as recited in claim 1 of the present application. Agreement was not reached on either point. The Examiner contended that, as to (1), the nickel present in the MCrAlY coatings constituted a "braze alloy"; and, as to (2), the braze alloy described in Turner contains carbon and chromium, and Turner provides a description of the tendency of chromium-containing alloys containing an excess of carbon to form chromium carbide precipitates, thereby inherently describing a braze alloy containing chromium carbide particles.

Applicants further proposed an amendment to claim 1 to recite a method wherein a preform is provided and attached after having been provided, to emphasize that the preform is a solid object placed on the substrate rather than built up on the substrate in a layer by layer fashion. The Examiner indicated that such an amendment would likely differentiate the instant claim over the applied references, but further indicated such an amendment would require further search and examination and thus would not be entered without a Request for Continued Examination (RCE).

Applicants respectfully submit this response in conjunction with an RCE in light of the results of this interview.

#### Claim Rejections under 35 USC 102

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The Examiner rejected claim 1 and claim 13 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,714,202 (Lemelson et al., hereinafter Lemelson). Anticipation requires the disclosure in a single prior art reference of each element of the claims under consideration. The Applicants respectfully traverse this rejection.

The amended independent claim 1 of the present invention recites a method for coating a substrate comprising steps of providing a preform and attaching the preform to a provided substrate after the preform has been provided. The preform includes braze alloy and wear resistant particles. In contrast, Lemelson is directed to multi-layer coatings for gas turbine engine parts (abstract). Lemelson teaches layer-by-layer building of the wear resistant coating. Lemelson teaches applying a MCrAlY bond coat using a plasma spray coating over the substrate. An adherent alumina layer is formed on a polished surface of the MCrAlY coat and a columnar ceramic layer is adhered on the alumina layer. Diamond coating is applied over the columnar ceramic layer using chemical vapor deposition (col. 4, 45-57).

Lemelson does not teach, suggest, or disclose every element recited in the rejected claims. Lemelson fails to remotely teach, suggest, or disclose (1) a braze alloy and (2) attaching a preform to the substrate after the preform has been provided.

First, Lemelson fails to teach, suggest, or disclose a braze alloy. The Examiner appears to be equating the MCrAlY coating ("bond coat") with the "braze alloy" recited in instant independent claim 1. This is not a proper interpretation, because it is well known in the art that brazing alloys melt at temperatures lower than the melting temperature of the substrate material (see, for example, the specification, page 7, lines 16-20), while MCrAlY is a well-known and widely used coating material for providing high-temperature environmental resistance for superalloys and other high temperature metals. See for example <http://www.sermatech.com/resourceCenter/glossary.html> ("MCrAlY - An acronym for Metal (Ni, Co, or Fe base or mixtures thereof) + Chromium+Aluminum+Yttrium. These are coating compositions primarily suited for gas turbine hot section components.") One skilled in the art would not construe MCrAlY to be a braze metal, particularly where, as in the applied reference, the application involves superalloy components, which have melting points similar to, or even below, that typical of MCrAlY material.

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The Examiner advanced the opinion during the April 5, 2006 interview that he considers the nickel in the MCrAlY material to be a "brazing alloy". Applicants respectfully submit that this position is technically untenable. Where nickel is present in an MCrAlY coating, it is chemically combined with the other elemental components of the coating to form a high temperature, oxidation resistant alloy. The nickel is not available to participate independently in any brazing operation. MCrAlY is an alloy (as in Lemelson, where a specific example composition of 18% Cr - 23% Co - 12.5% Al - 0.3% Y, bal. Ni is given); it is not a sequential deposition of independent metallic elements. See, for example, <http://www.thomas-sourmail.org/coatings/mcraly.html> ("MCrAlY coatings typically exhibit a two-phase microstructure  $\beta+\gamma$ ".) Beta and gamma intermetallic phases, the microstructural constituents of MCrAlY, are also constituents in many superalloy materials. No one skilled in the art would construe the use of this high temperature material on a superalloy substrate (as it is used in Lemelson) as the use of a brazing material.

Second, Lemelson fails to teach, suggest, or disclose attaching a preform to the substrate after the preform has been provided, as is recited in instant claim 1. The Examiner considers the coating layer of Lemelson to be a "preform." Although Applicants respectfully maintain their disagreement with the Examiner over the meaning of the term "preform," as that term is known in the art and as it is used in the specification, Applicants further point out that even if the coating can be considered a preform, a coating formed on the very substrate to be ultimately coated is attached to that substrate as part of the process of making the coating. As a result, there can be no step of attaching the preform to the substrate after the preform has been provided.

Because Lemelson fails to teach, suggest, or disclose (1) a brazing alloy and (2) attaching a preform to the substrate after the preform has been provided, Applicants respectfully submit that claim 1 and its dependent claim 13 are allowable over this reference.

The Examiner rejected claims 1, 9, 10, and 12 under U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,190,124 (Freling et al., hereinafter Freling). Applicants respectfully traverse this rejection.

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Freling describes an abrasive tip 28 including metallic bond coat 38, an aluminum oxide layer 42, and zirconium oxide abrasive coat 44. The abrasive tip of Freling is, like the material in Lemelson, above, built layer by layer on the substrate by coating deposition methods, using an MCrAlY bond coat. The Examiner, as above for the Lemelson rejection, is considering the MCrAlY bond coat to be a braze material and a preform.

Applicants raise the same two arguments against Freling as were raised against Lemelson. First, there is no suggestion of a braze material. As described above, MCrAlY cannot be fairly construed to be a braze material, especially where, as in Freling, the substrate material is a superalloy (col. 5, lines 25-29). Second, the material in Freling is disposed via layer-by-layer deposition on the very substrate ultimately to be coated, so there is no suggestion that a preform is attached to the substrate after the preform has been provided. For these reasons, Applicants respectfully submit that claim 1 and its dependent claims 9, 10, and 12 are allowable over Freling.

Claims 1, 10 and 11 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 2,763,920 (Turner et al., hereinafter Turner). The Applicants respectfully traverse this rejection.

Turner is directed to providing an impact resistant coating comprising a ductile nickel-chromium alloy (col. 2, 20-25) onto a substrate. The alloy is coated onto the article by spraying liquefied metal onto the article, by dipping the article into molten alloy, by spraying a powdered alloy through a hot flame (i.e., thermal spraying), or by feeding the alloy as a rod into a flame and spraying the resultant liquid metal onto the article. See Col. 3, line 72 - Col. 4, line 15.

Turner does not teach, suggest, or disclose attaching a preform to the substrate after the preform has been provided, as is recited by independent claim 1. As in the two previous rejections discussed above, Turner involves coating material onto the substrate, and so the material is attached to the substrate at the same time that the material is being provided. As a result, there can be no step of attaching the preform to the substrate after the preform has been provided. As Turner fails to teach, suggest, or disclose the step of attaching the preform to the substrate after the preform has been provided, Applicants

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respectfully submit that claim 1 and its dependent claims 10 and 11 are allowable over this reference.

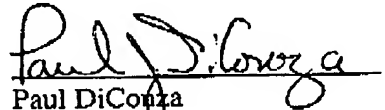
Claim Rejections under 35 USC 103

The Examiner rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Freling and further in view of JP. Patent No. 3-232707 (Akiyama et al., hereinafter Akiyama).

As discussed above, Applicants believe Claim 1 recites allowable subject matter. Therefore, claim 14 which depends directly from claim 1 is believed to be clearly patentable over Freling and further in view of Akiyama. The Applicants therefore respectfully request that the Examiner withdraw the rejection of claim 14 under 35 U.S.C. 103(a).

In view of the foregoing arguments the Applicants respectfully request reconsideration and prompt allowance of all pending claims 1-27. If the Examiner believes that a telephonic interview will help speed this application towards issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

  
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Friday, April 07, 2006

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